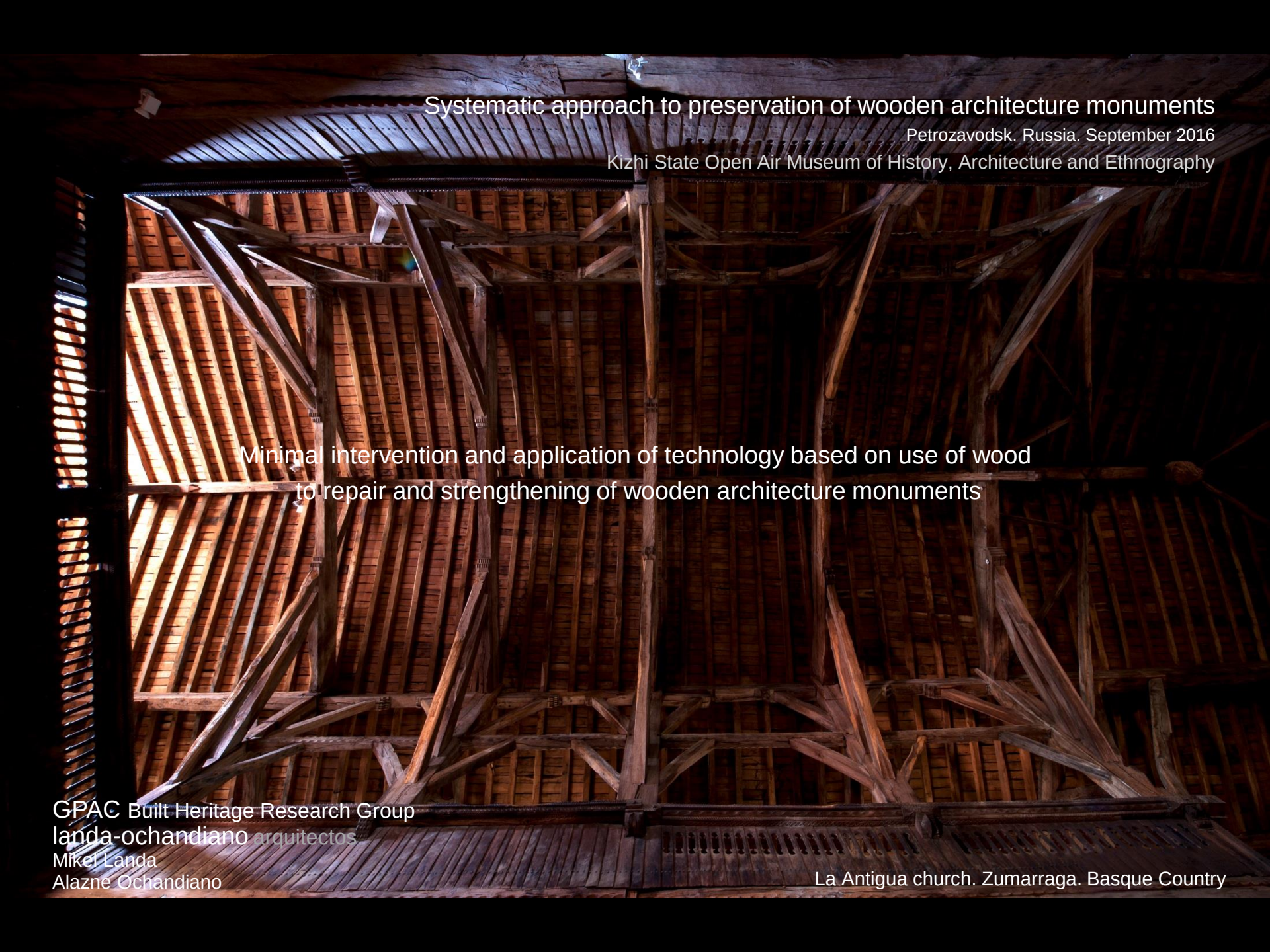




Systematic approach to preservation of wooden architecture monuments

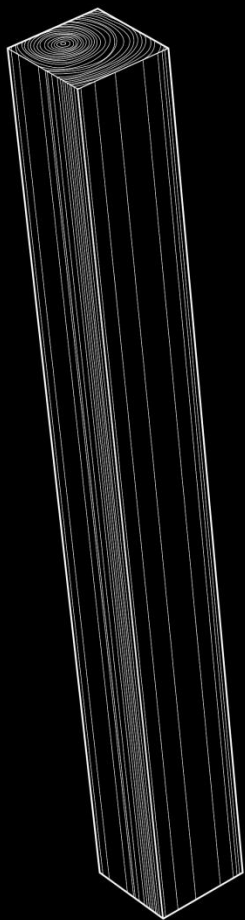
Petrozavodsk. Russia. September 2016

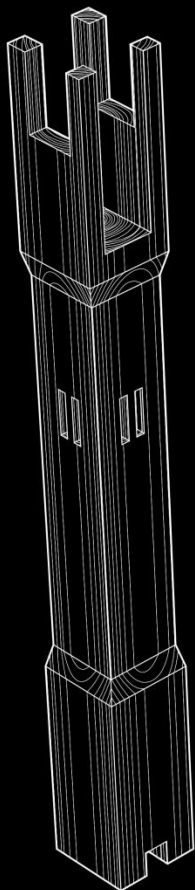
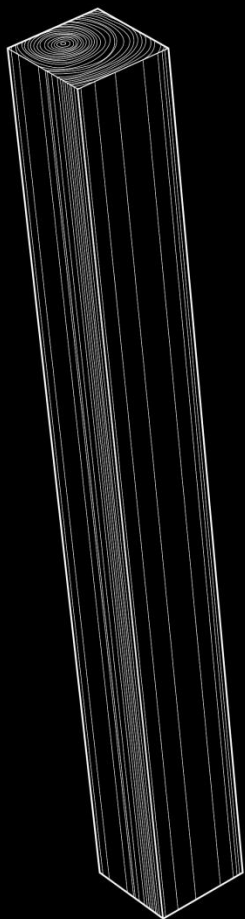
Kizhi State Open Air Museum of History, Architecture and Ethnography

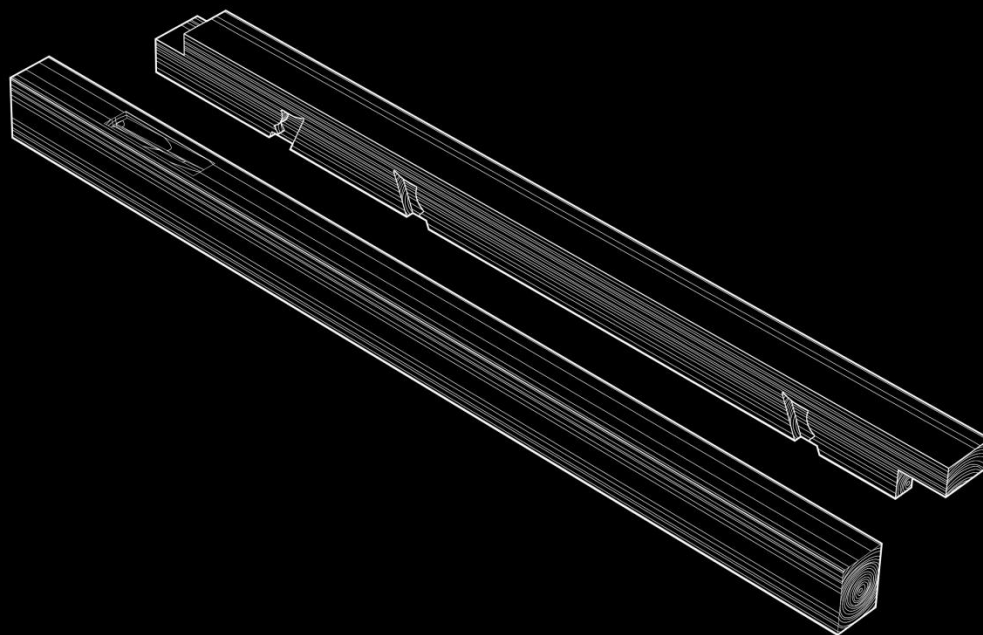
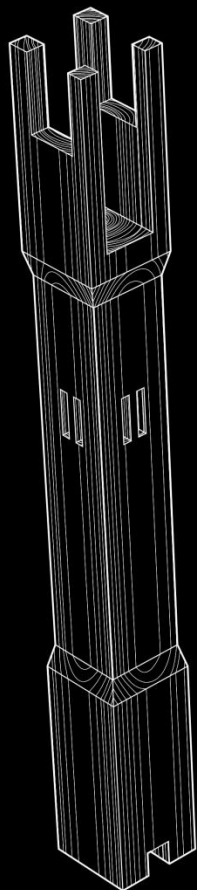
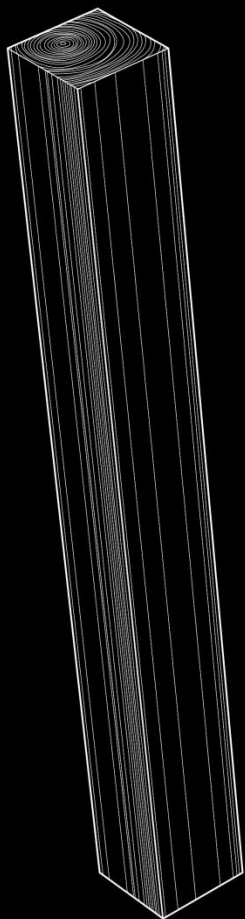
Minimal intervention and application of technology based on use of wood
to repair and strengthening of wooden architecture monuments

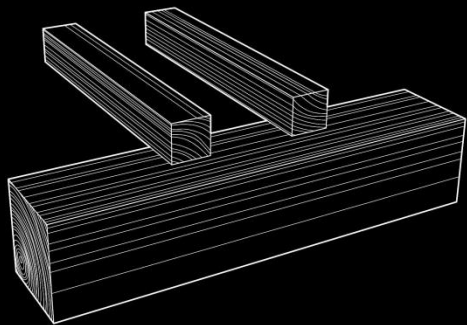
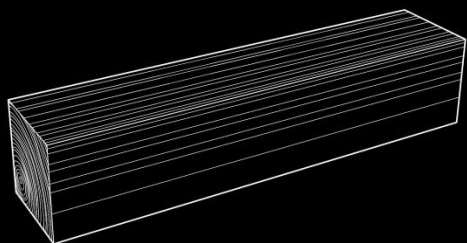
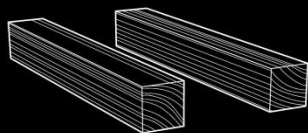
GPAC Built Heritage Research Group
landa-ochandiano arquitectos
Mikel Landa
Alazne Ochandiano

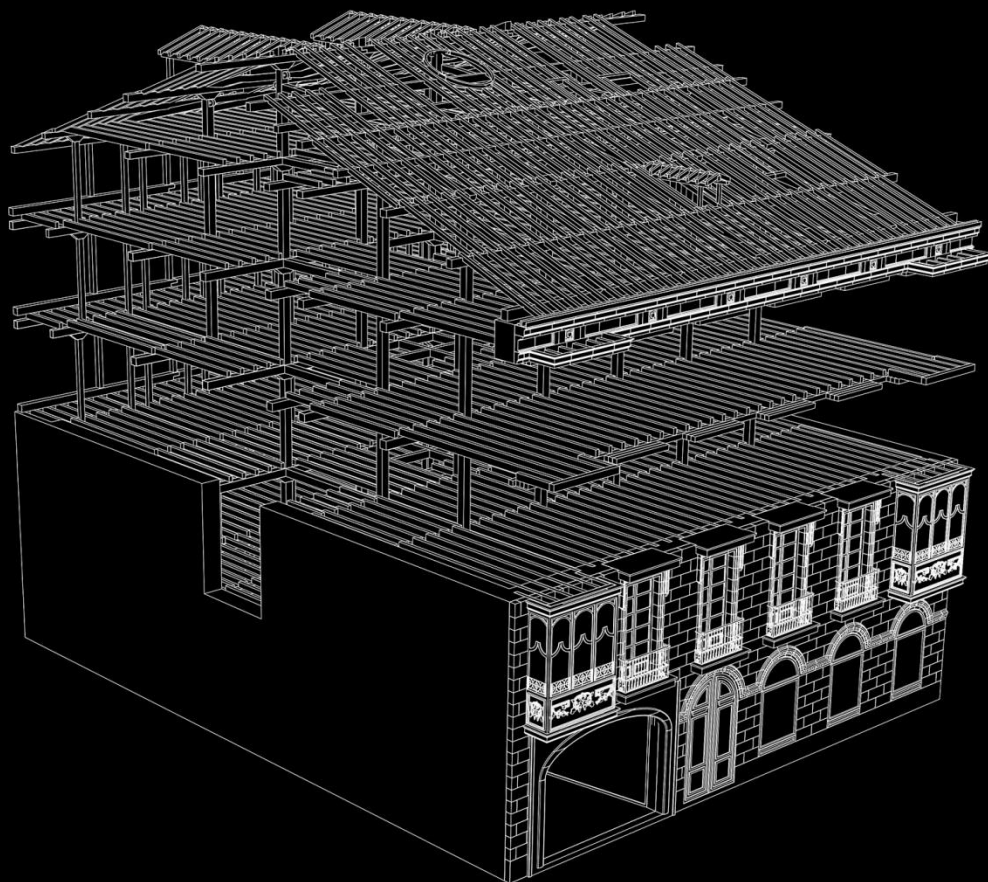
La Antigua church. Zumarraga. Basque Country



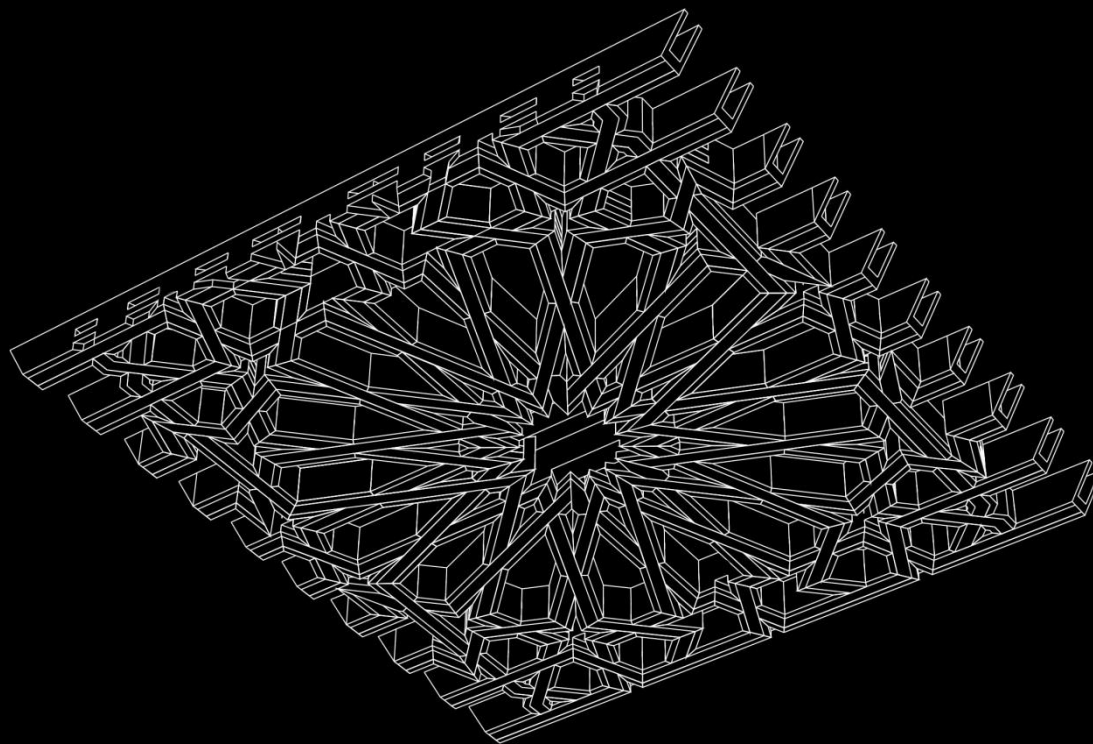










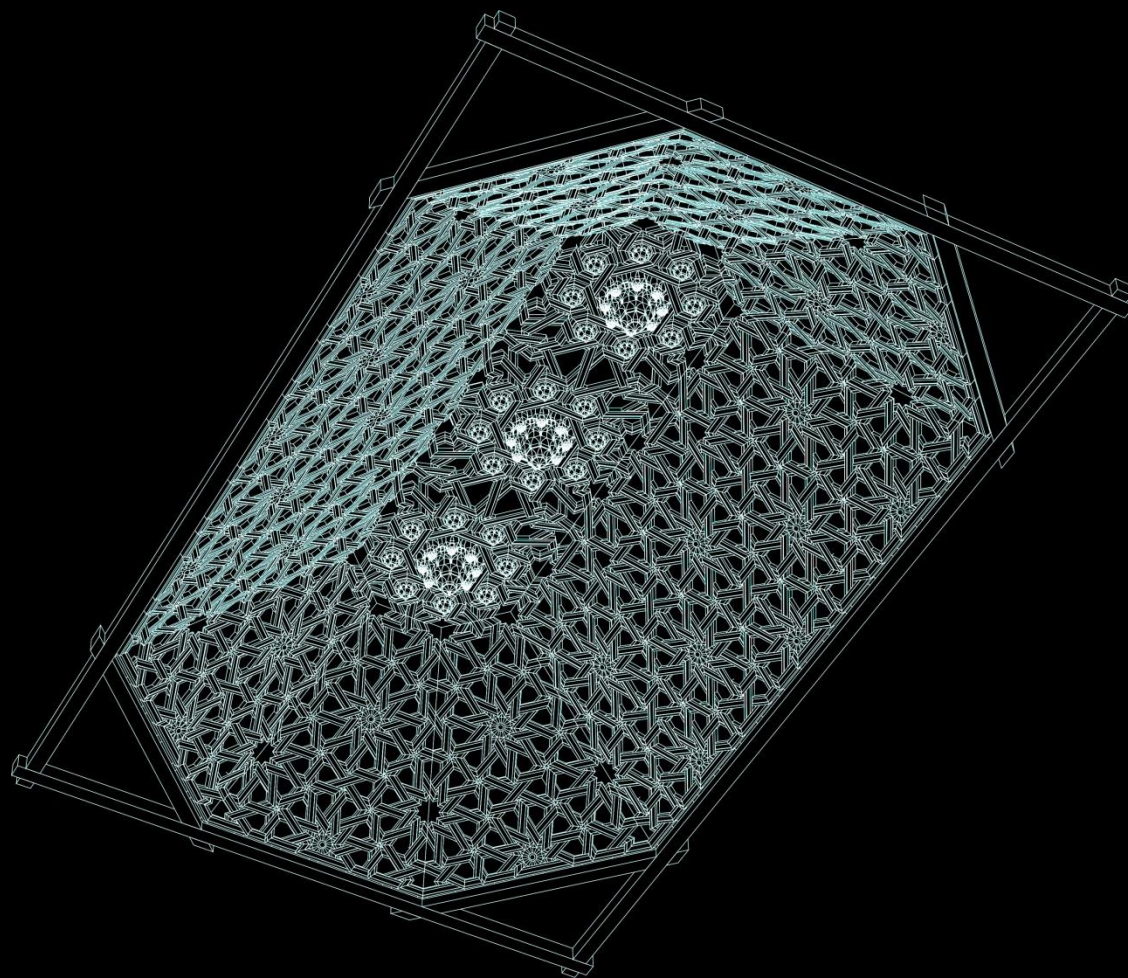




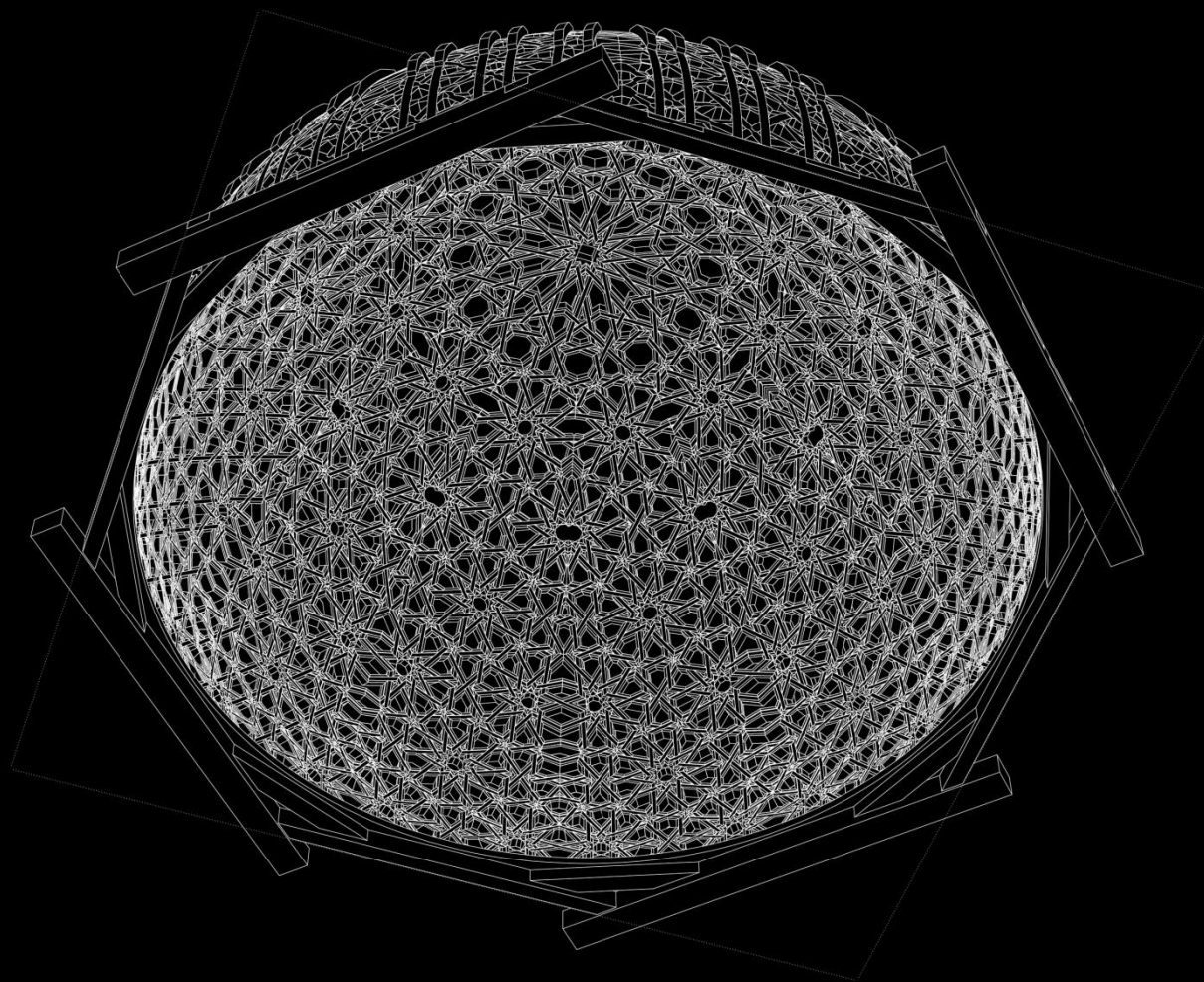
Saint John church. San Juan de la Encinilla. Spain



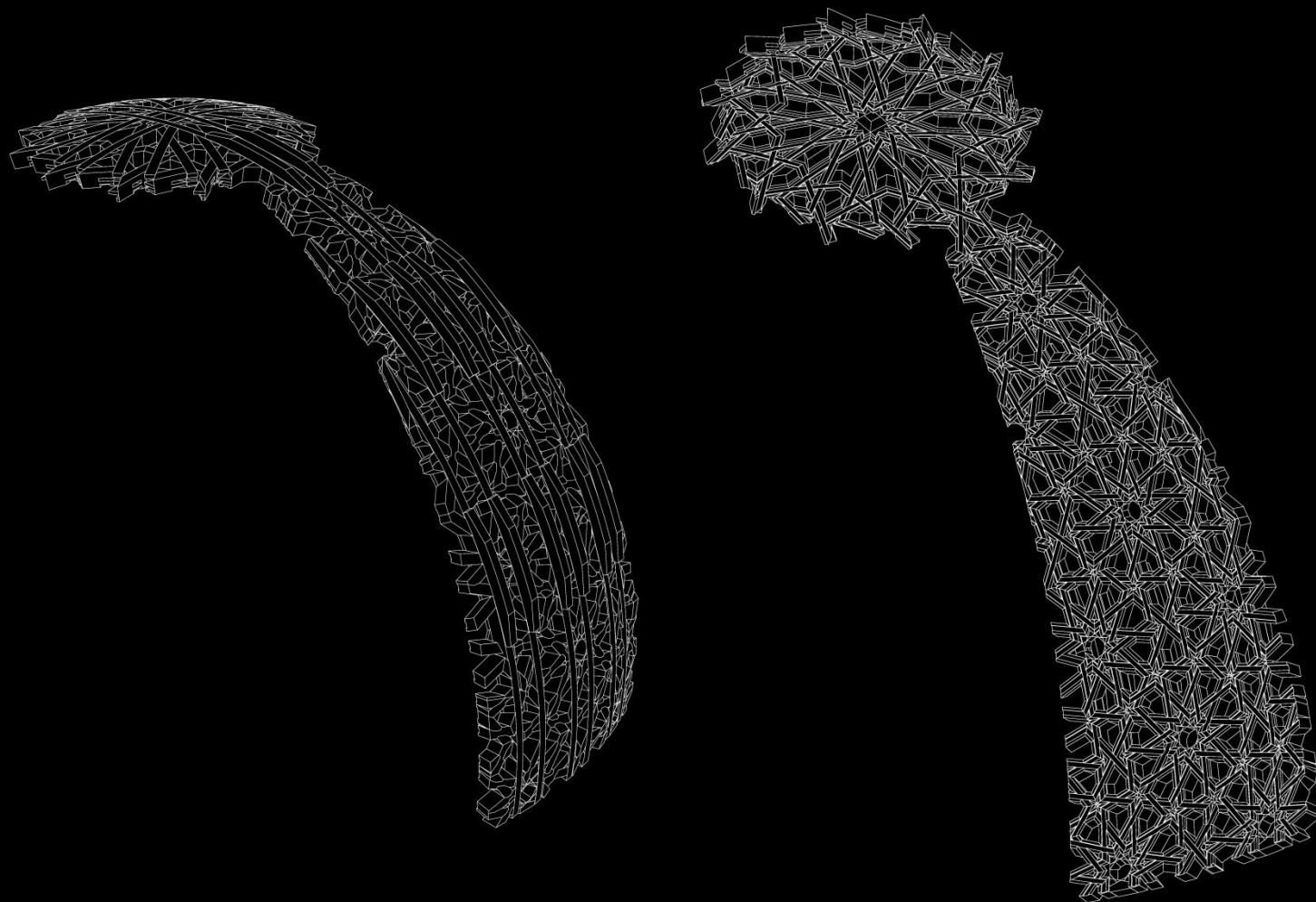
Del Tránsito synagogue. Toledo



San Antonio el Real. Segovia



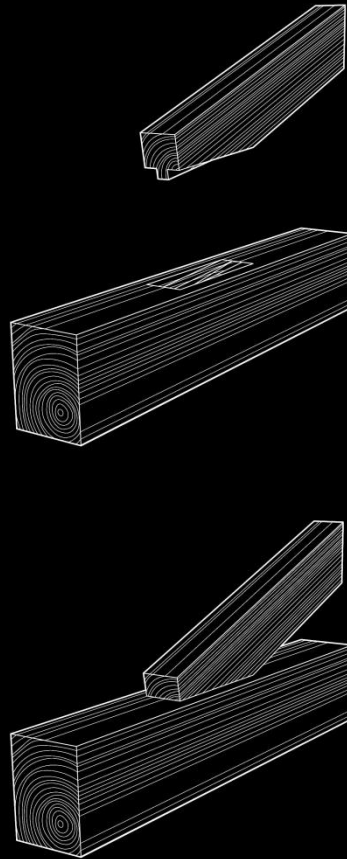
Wooden dome. Ambassadors room. Alcazar de Sevilla



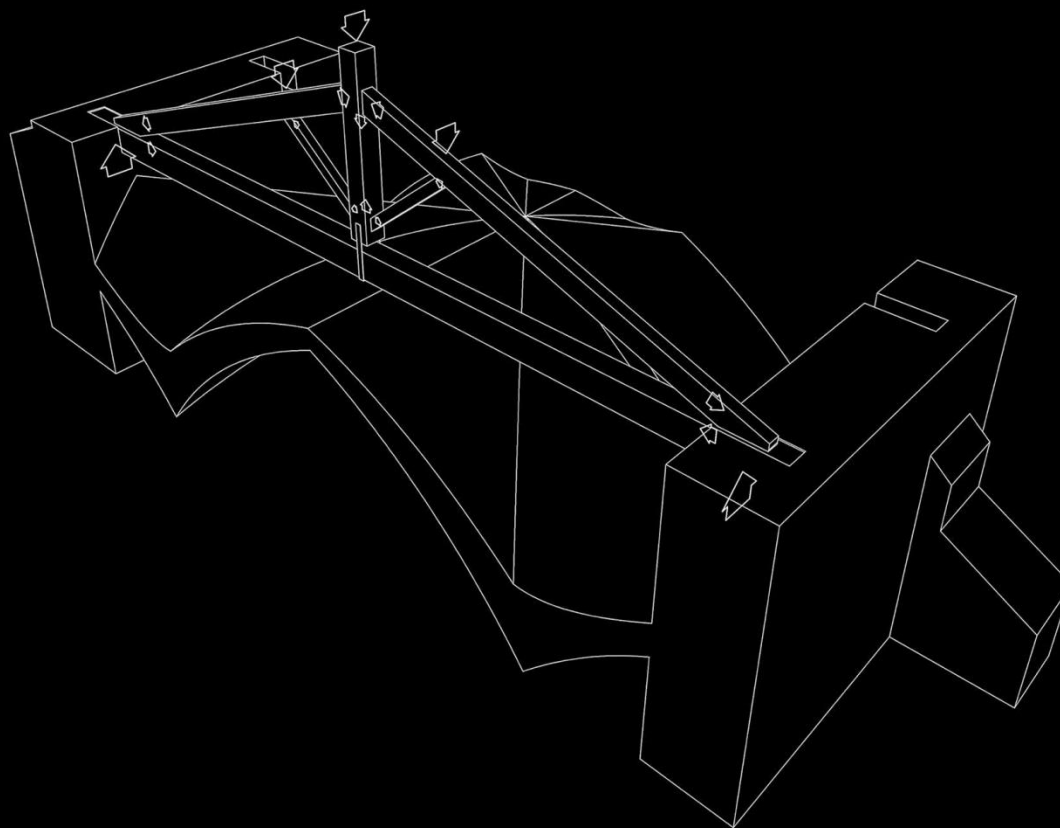
Wooden dome. Ambassadors room. Alcazar de Sevilla



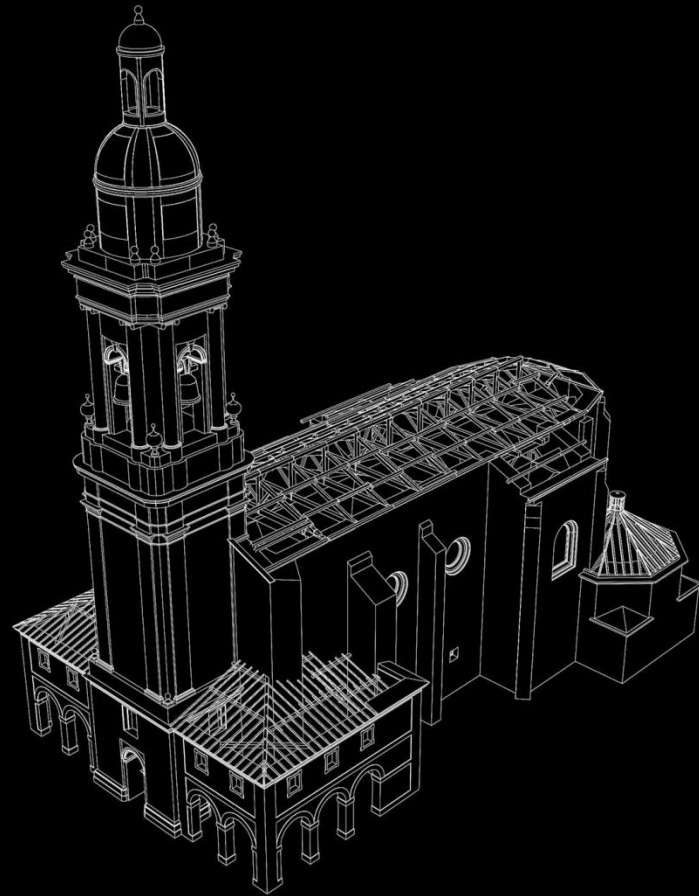
Wooden dome. Ambassadors room. Alcazar de Sevilla



San Blas church. Alegria-Dulantzi. Spain



San Blas church. Alegria-Dulantzi. Spain



San Blas church. Alegria-Dulantzi. Spain



Saint Andrew church. Ibarangelu. Basque Country



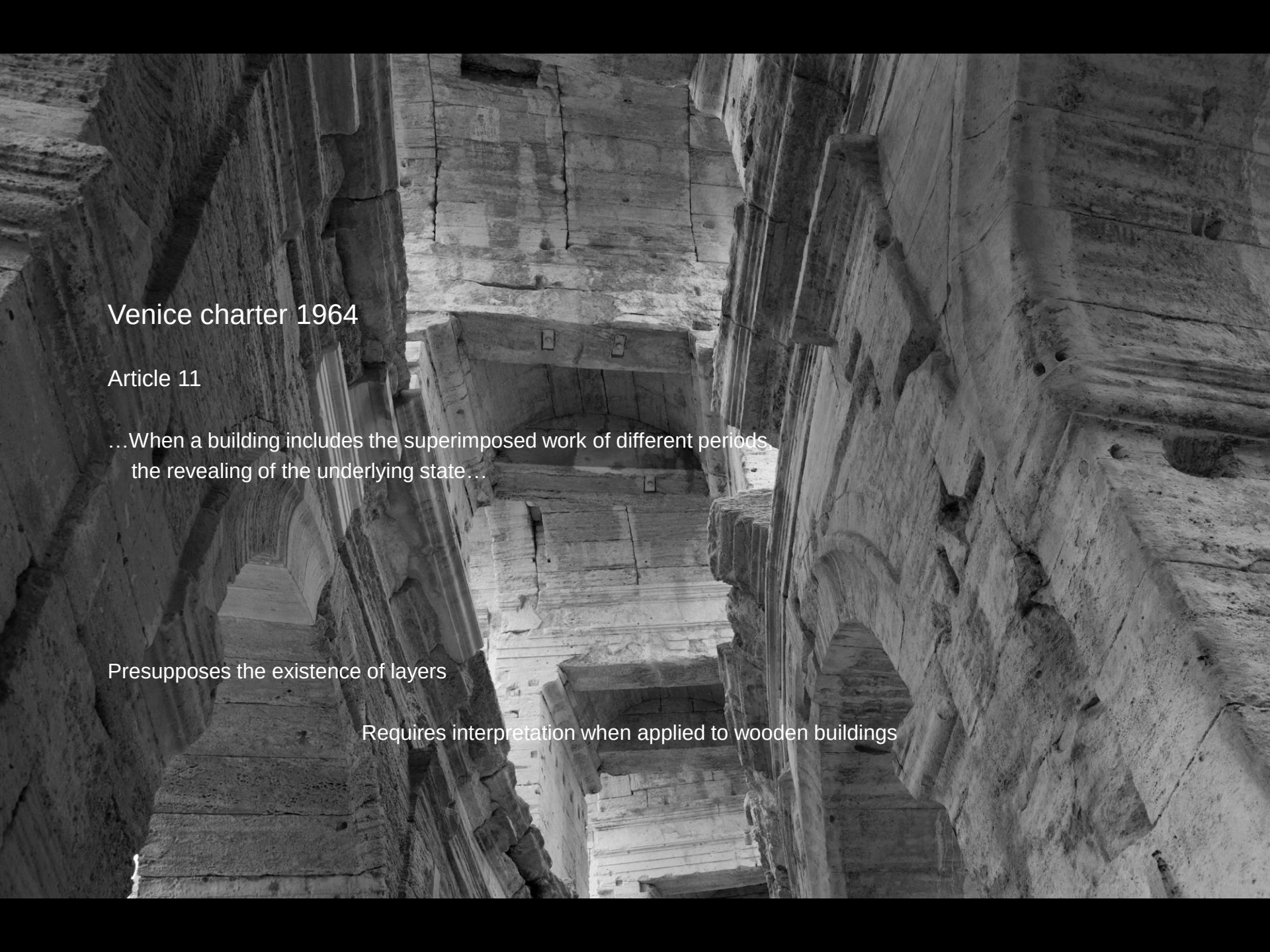
Santa Marina church. Markina. Basque Country



La Antigua church. Zumarraga. Basque Country

“do historic buildings made of wood behave differently from buildings made of more durable materials so that the internationally accepted preservation doctrine is less relevant?”

Larsen, K. E. (1994). Architectural Preservation in Japan

A black and white photograph of ancient stone ruins, likely a Roman or Greek temple or forum. The image shows a series of arches and columns, with the stone showing signs of weathering and decay. The perspective is looking down a central corridor or street, with the ruins on either side.

Venice charter 1964

Article 11

...When a building includes the superimposed work of different periods,
the revealing of the underlying state...

Presupposes the existence of layers

Requires interpretation when applied to wooden buildings

Material authenticity

Integrity

“refers to the process of identification of all the elements that together define the significance of the property”

Authenticity

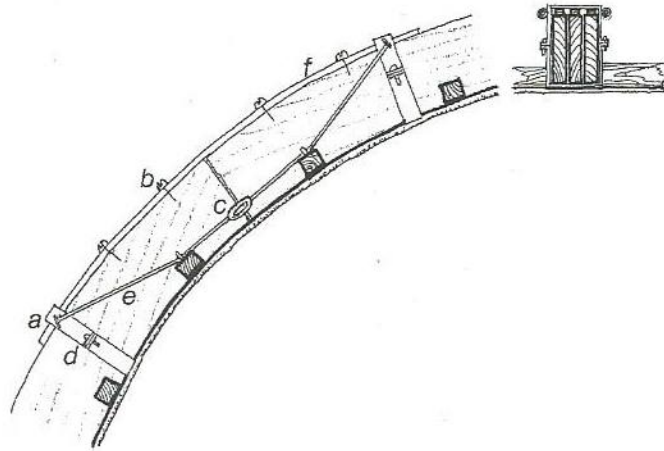
“refers to the qualification of such elements in terms of truthfulness and credibility”

Revisiting Conservation Philosophy of Wooden Structures:
Restoration Methodology and Philosophy of Conservation of Wooden Structures
Nara. Japan. December 2013

Tangible: **material**

Intangible: **to resist**

Material authenticity



It is relevant that the conservation of a structural wooden construction include every effort necessary to maintain together with the most possible of its material, the resistant function.



Keeping the structural function

Balanced with material authenticity

Repair

Repair

Repair is a painstaking intervention in a wooden element, aiming at replacing only decayed parts and otherwise leaving the structure and the materials intact

Repair consists in the actions aimed to recover the whole or part of the lost structural efficiency of a wooden element or frame.

Authenticity

“The primary aim of conservation and preservation is to maintain the authenticity of the historic fabric.”

...the criteria of **minimum intervention**...

Revision and Updating of the Principles for the Preservation of Historic Timber Structures

IWC

Falun. Sweden. April 2016





Medieval tower in Donamaría. Navarra



Medieval tower in Donamaría. Navarra

Deformations



Change of use





Change of use

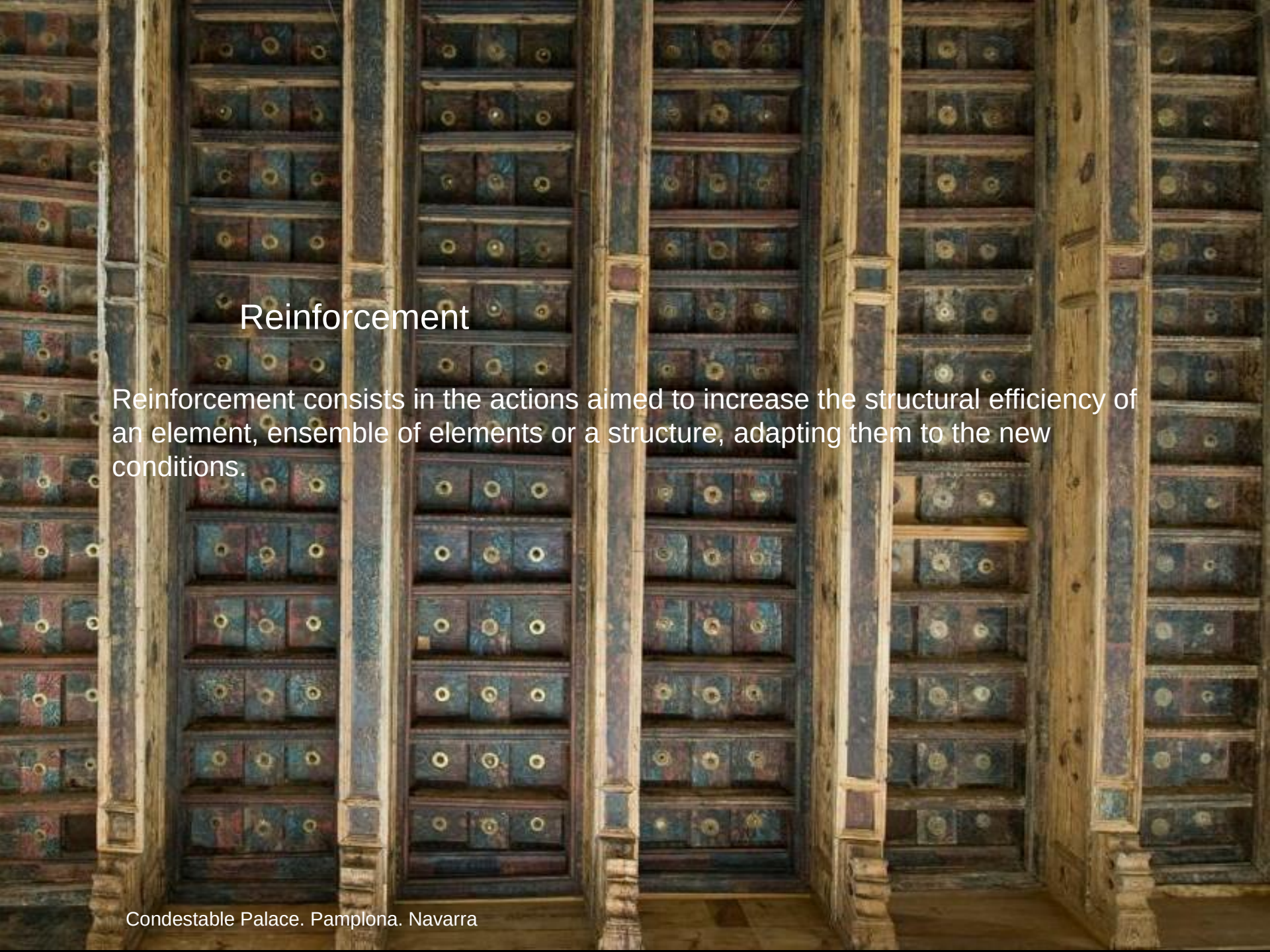
Condestable Palace. Pamplona. Navarra



Change of use

Consequences: to adapt the structure to new conditions.

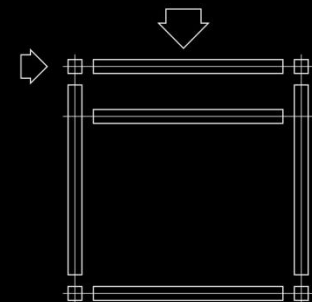
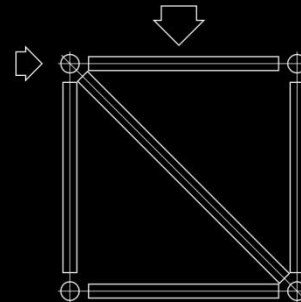
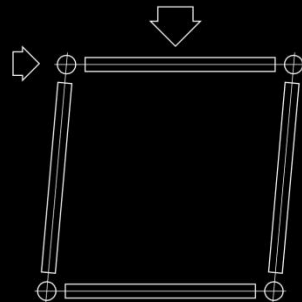
Need to reinforce



Reinforcement

Reinforcement consists in the actions aimed to increase the structural efficiency of an element, ensemble of elements or a structure, adapting them to the new conditions.

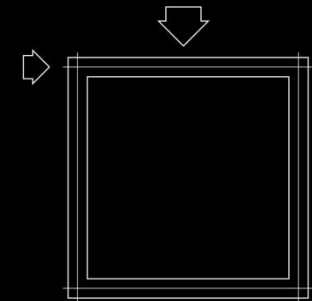
Intervention



Isostaticity

Intervene in:

- Part of a single element
- One element
- A set of elements
- The whole structure



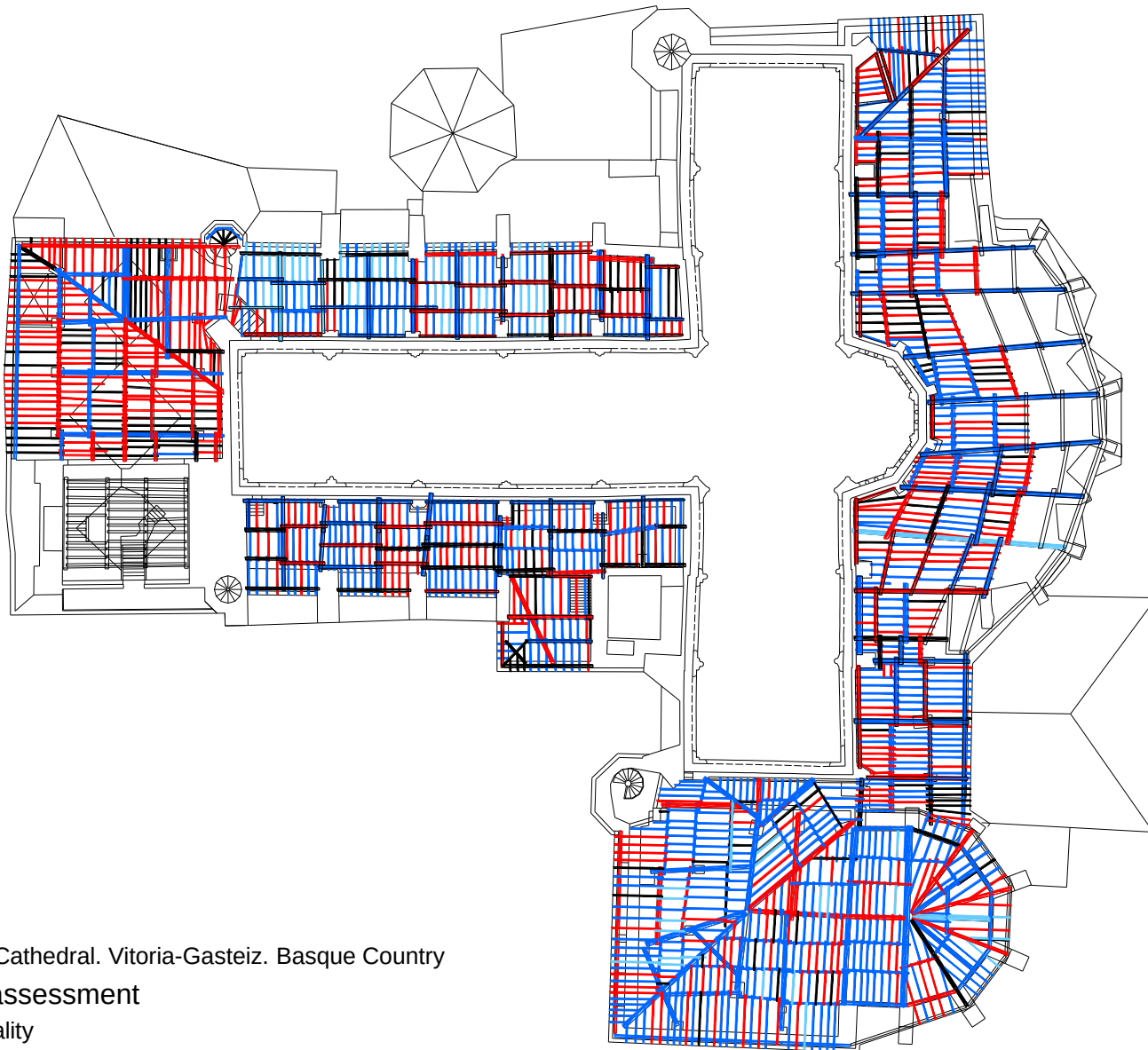
The capability to repair or reinforce one single element of a wooden structure enables to have the control of the whole structure.

Approach: Global Intervention: Local

Interventions

Surgical

Inspection
Evaluation



Santa María Cathedral. Vitoria-Gasteiz. Basque Country
Structural assessment
Structural quality
Triforium level. Secondary structure



Añana Salt Valley. Araba. Basque Country

Intervention techniques

Other materials

Concrete

Metallic

Prothesis

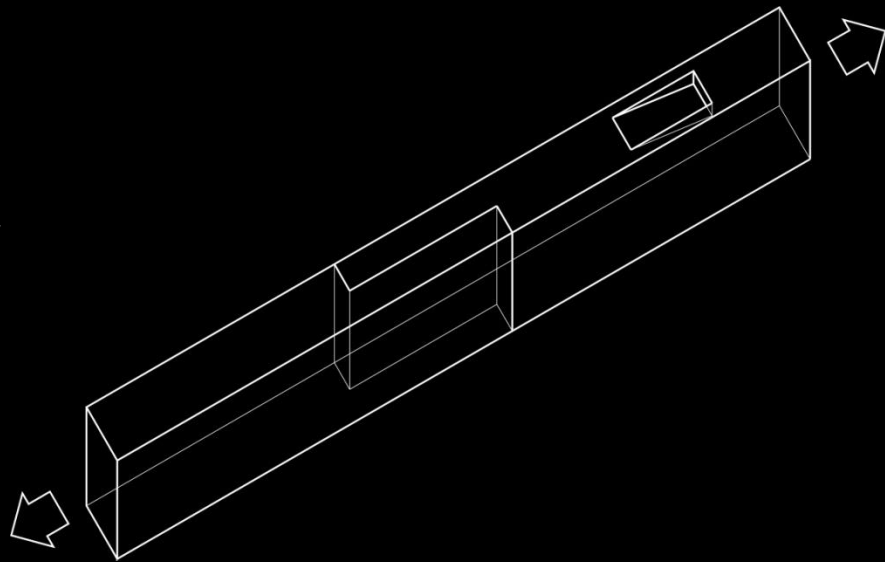
Composite

Grafts

Wood

Intervention

Repair of wood with **wood**: compatibility





Intervention methods

Repair

Graft

...repair or reinforcement carried out in a wooden structural element with the only use of wood and joining both parts with joinery, fasteners, glue or a combination of them.



Grafts
Replacement
Wood

St. Yuriy church. Drohobych. Ukraine



Grafts
Traditional joints
Wood

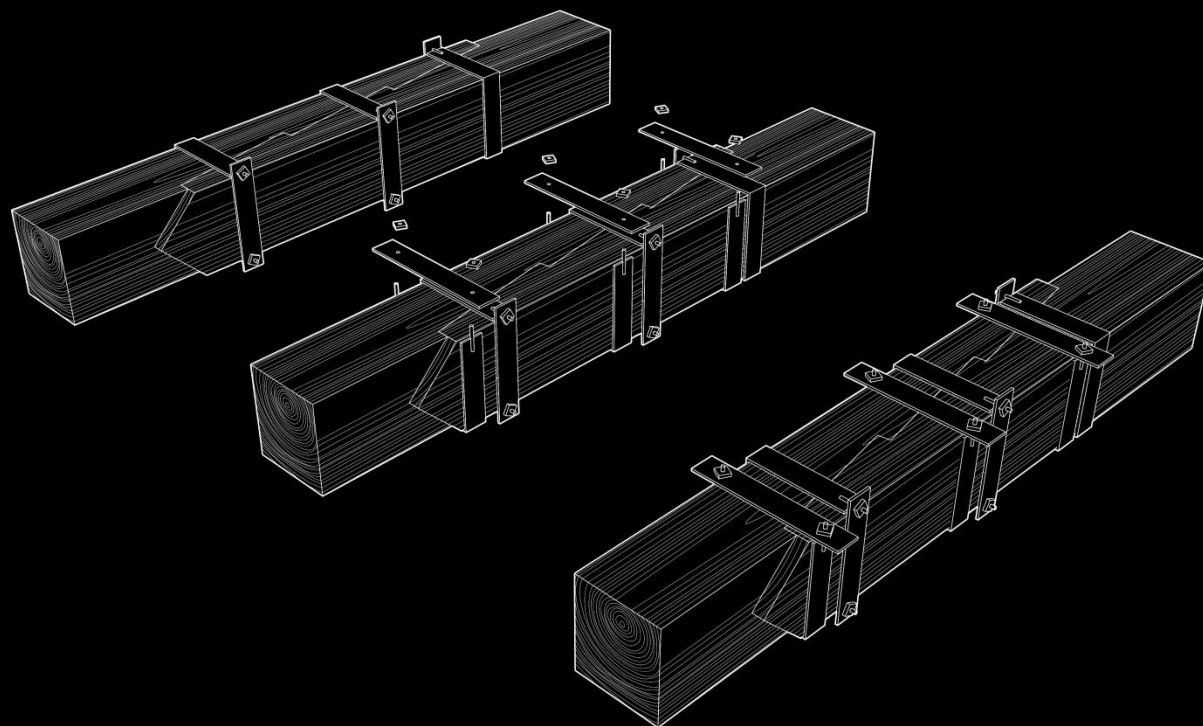


Grafts
Traditional modified
Wood
(Glue)

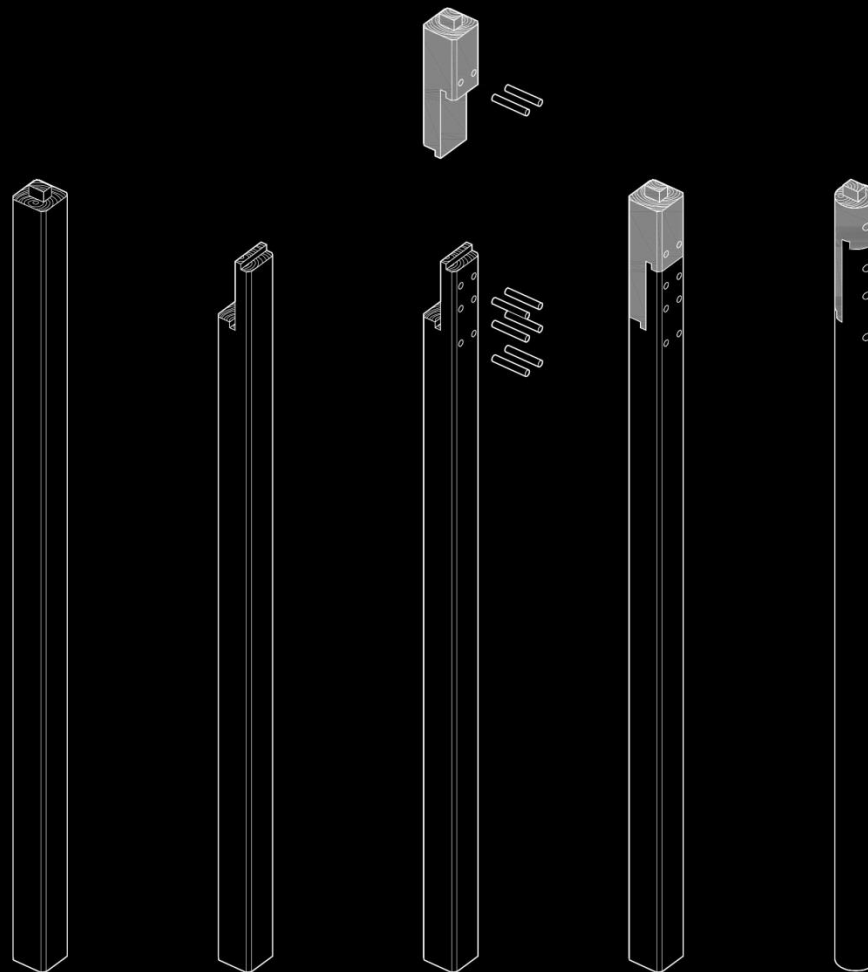


Grafts
Traditional modified
Wood

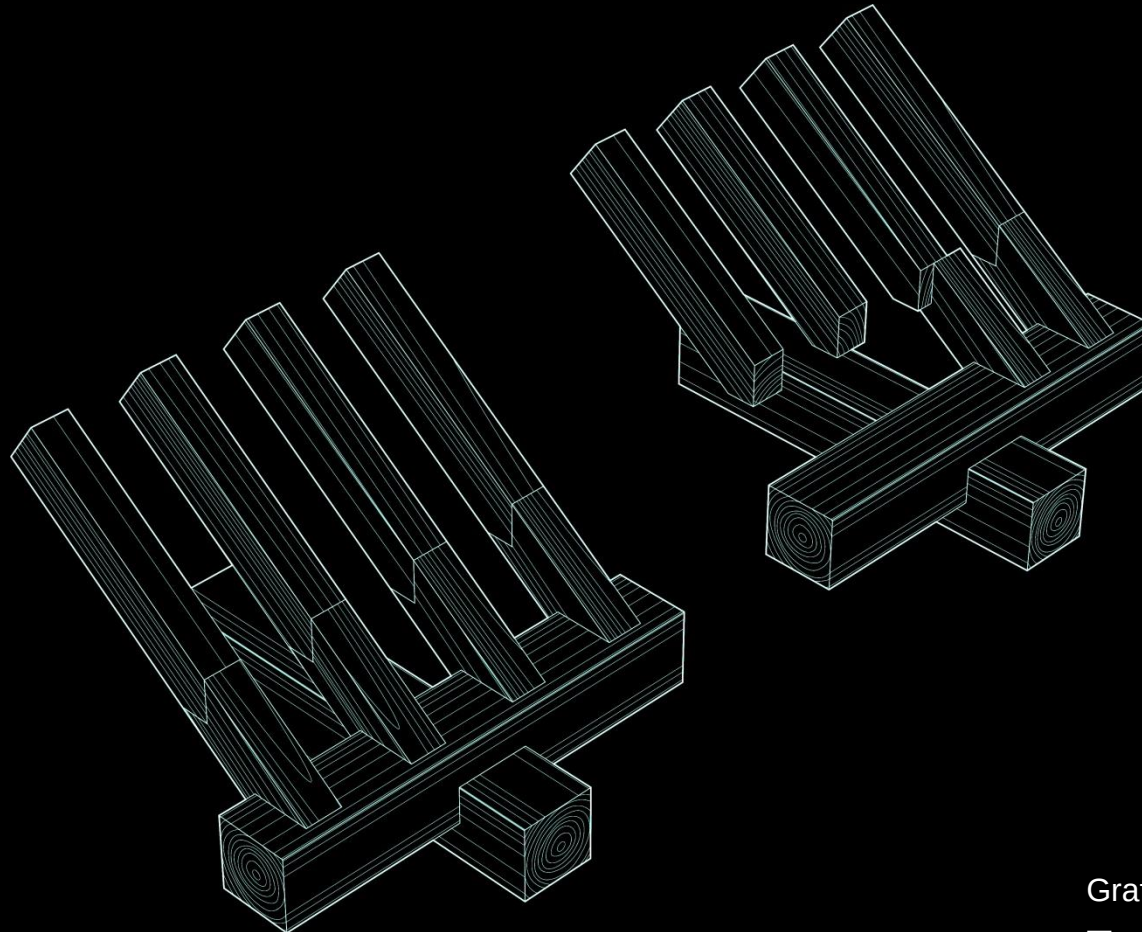
Church of the Presentation of the Virgin in the Temple. Barsana. Maramures. Romania



Grafts
Traditional joints
Wood
Metallic plates

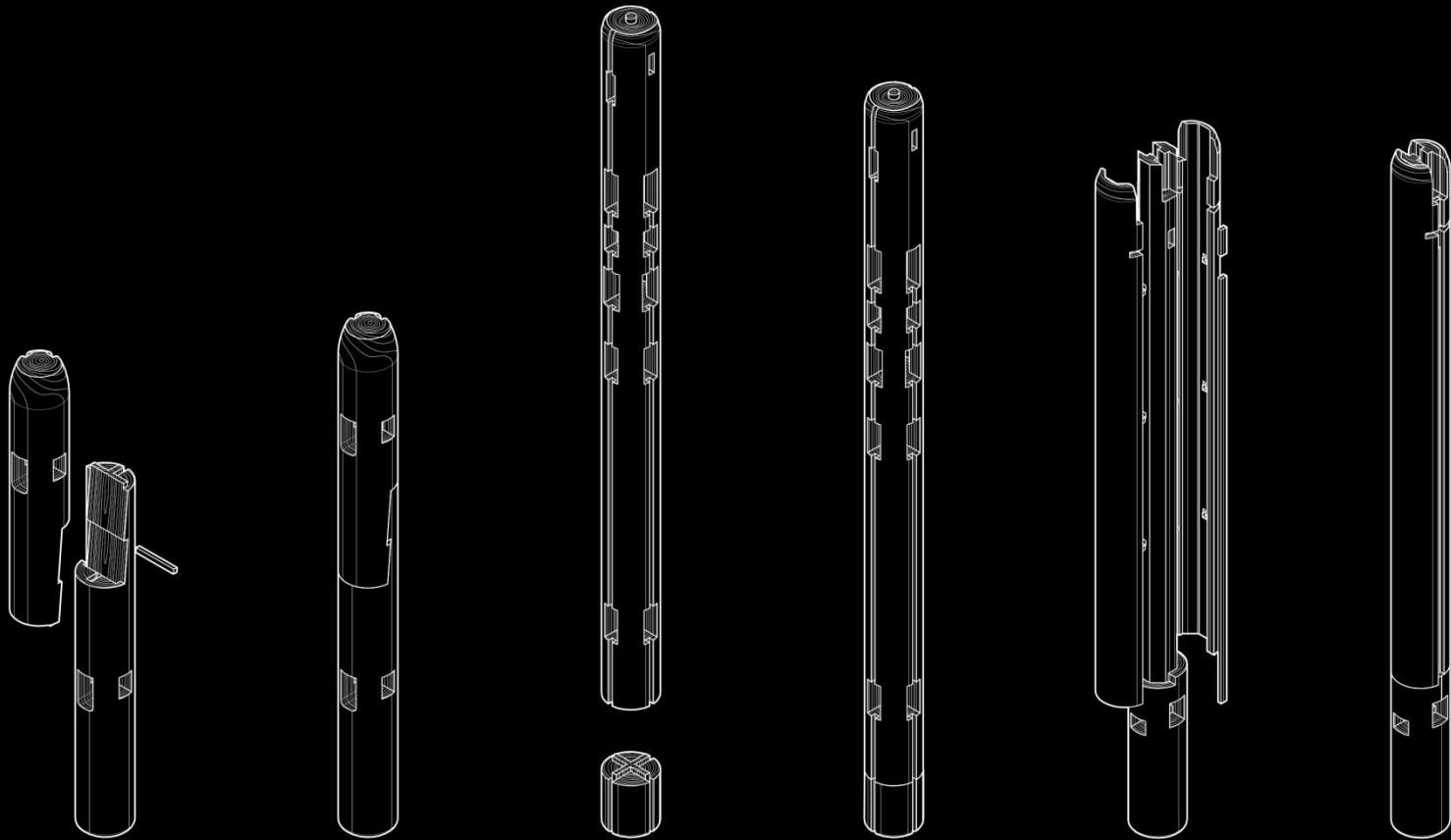


Grafts
Traditional joints
Wood
Pegs



Grafts
Traditional joints
Wood
Pegs
Glue

Enrique Nuere. Architect Ph.D.



Grafts

Traditional/Designed joints

Wood

Pegs

Glue



Grafts

Designed joints

Wood

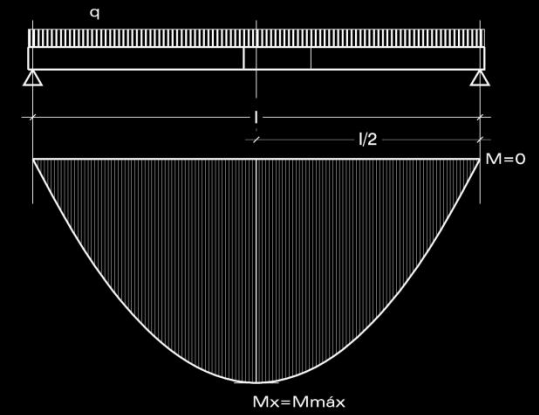
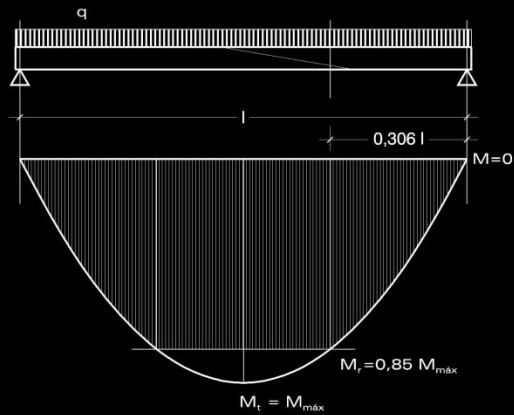
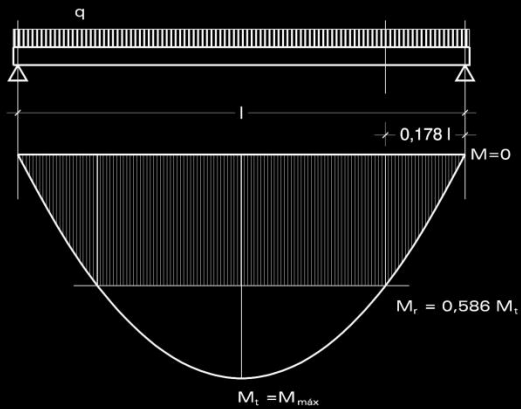
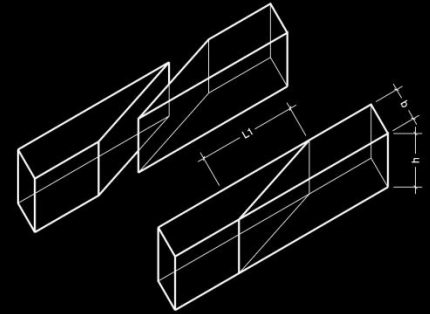
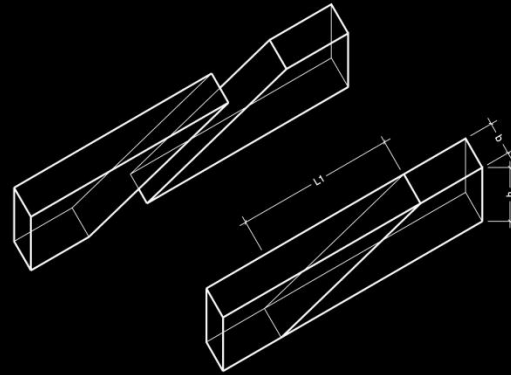
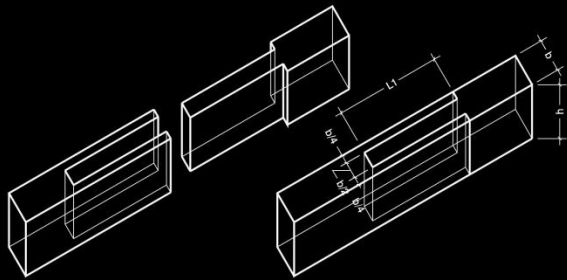
Nails

Glue

Repair of a joist. Gekko-den pavillion. Gokoku-ji temple. Tokyo



Grafts
Designed joints
Wood
Glue
Pegs



Grafts

Designed joints

Wood

Glue

Pegs

Repair solutions for a damaged beam



Grafts
Designed joints
Wood
Glue
Pegs

Condestable Palace. Pamplona. Navarra



Grafts
Designed joints
Wood
Glue
Pegs

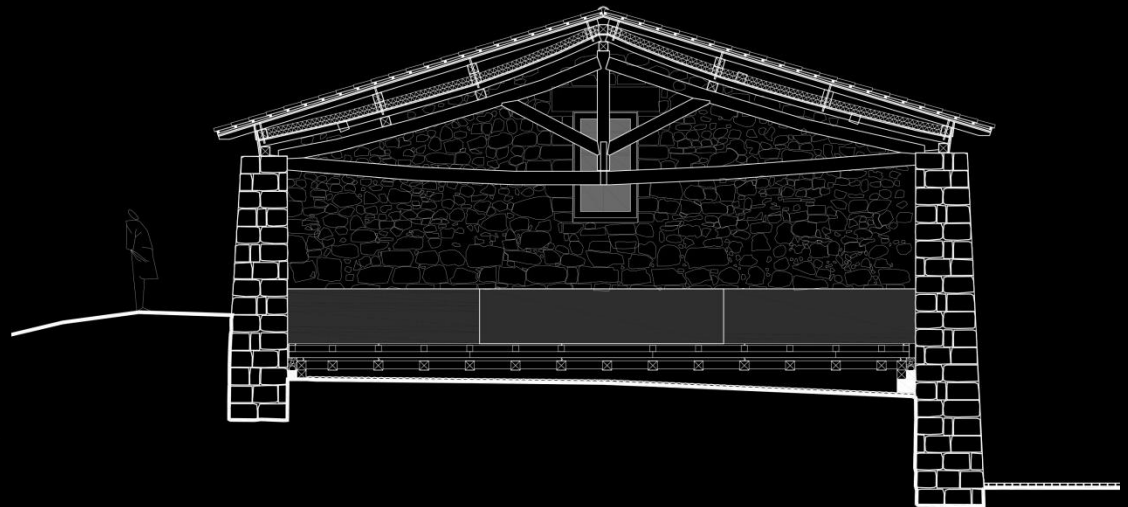
Condestable Palace. Pamplona. Navarra



Grafts
Reinforcement
Wood
Glue
Pegs



Minimum intervention
Max. material conservation
Respect the structural function
Respect the actual deformations
In situ intervention
Use of wood to solve issues related to wood

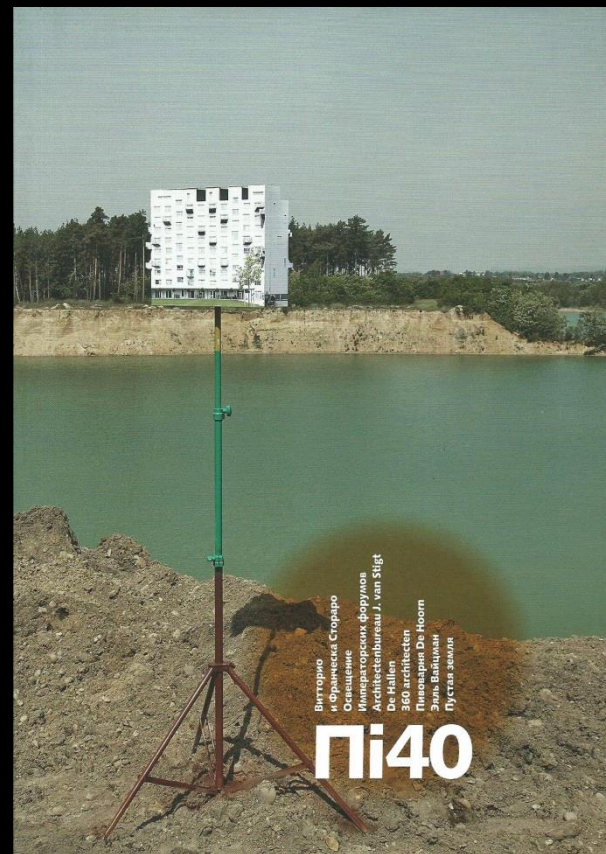


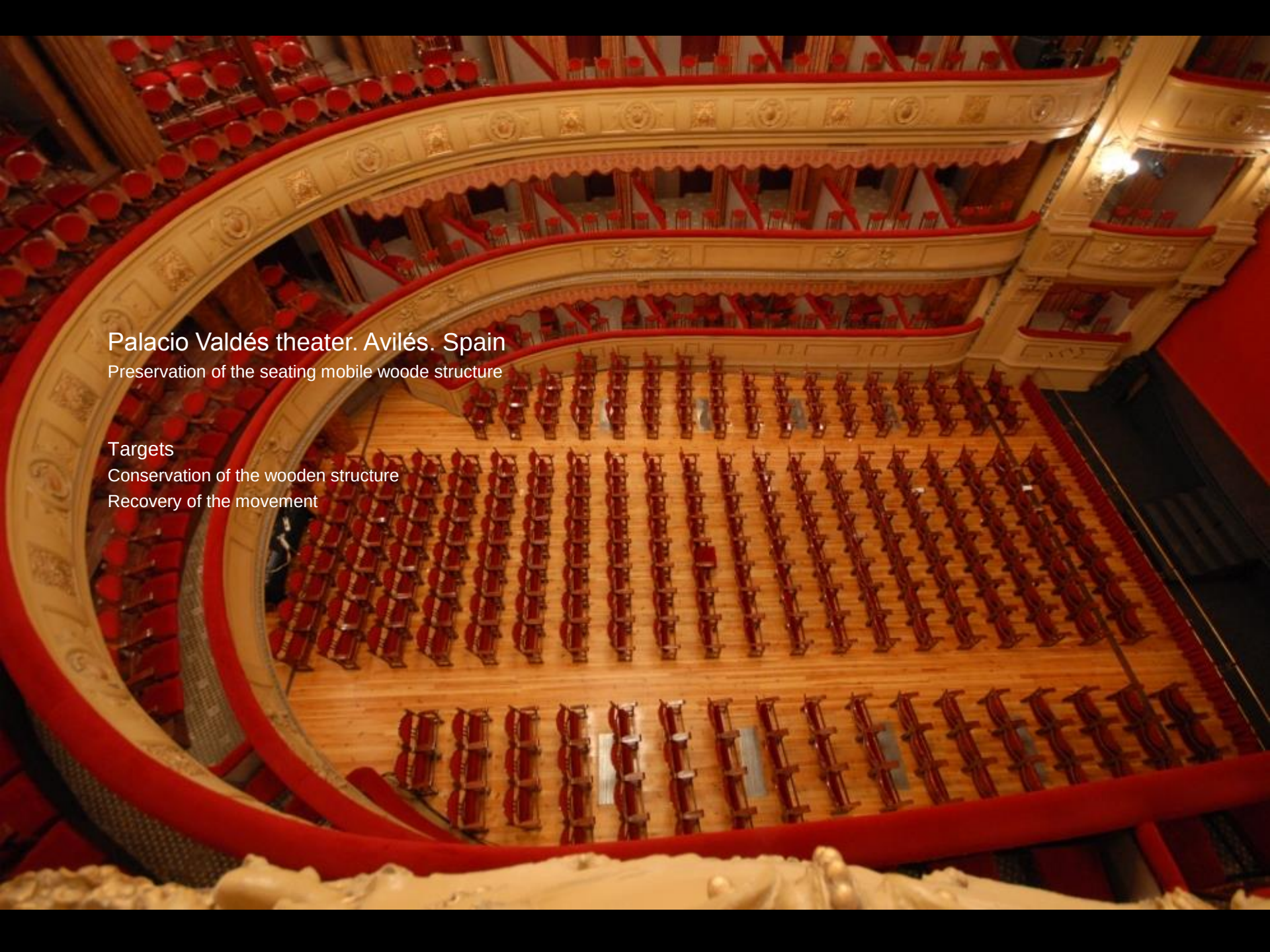


Valle Salado de Anana

Викторро
и Франческа Стораро
Одезские
Императорских Форумов
Architectenbureau J. van Stijf
De Hallen
360 architecten
Павоарин Де Ноом
Эль Вайцман
Пустая земля

пi40





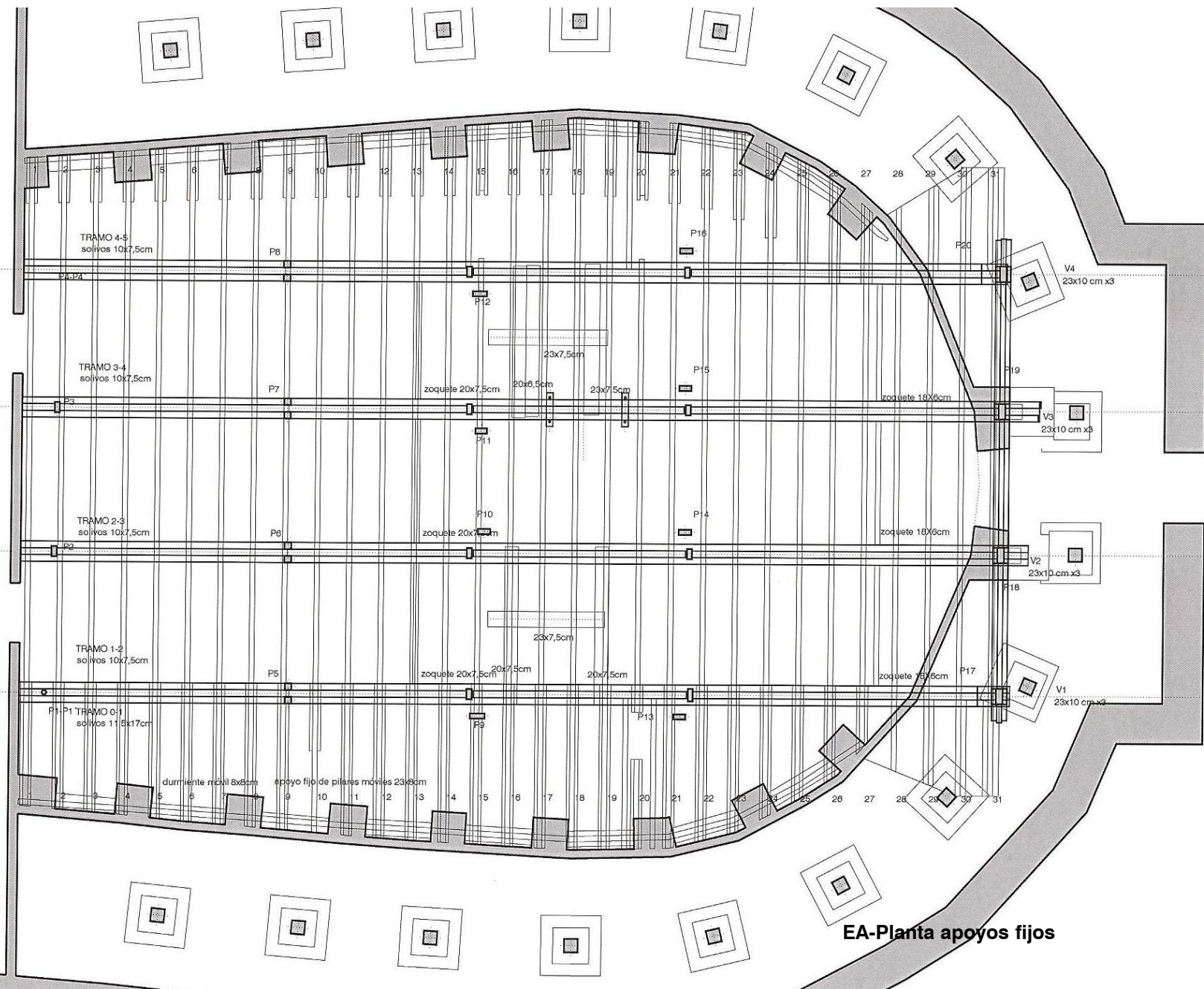
Palacio Valdés theater. Avilés. Spain

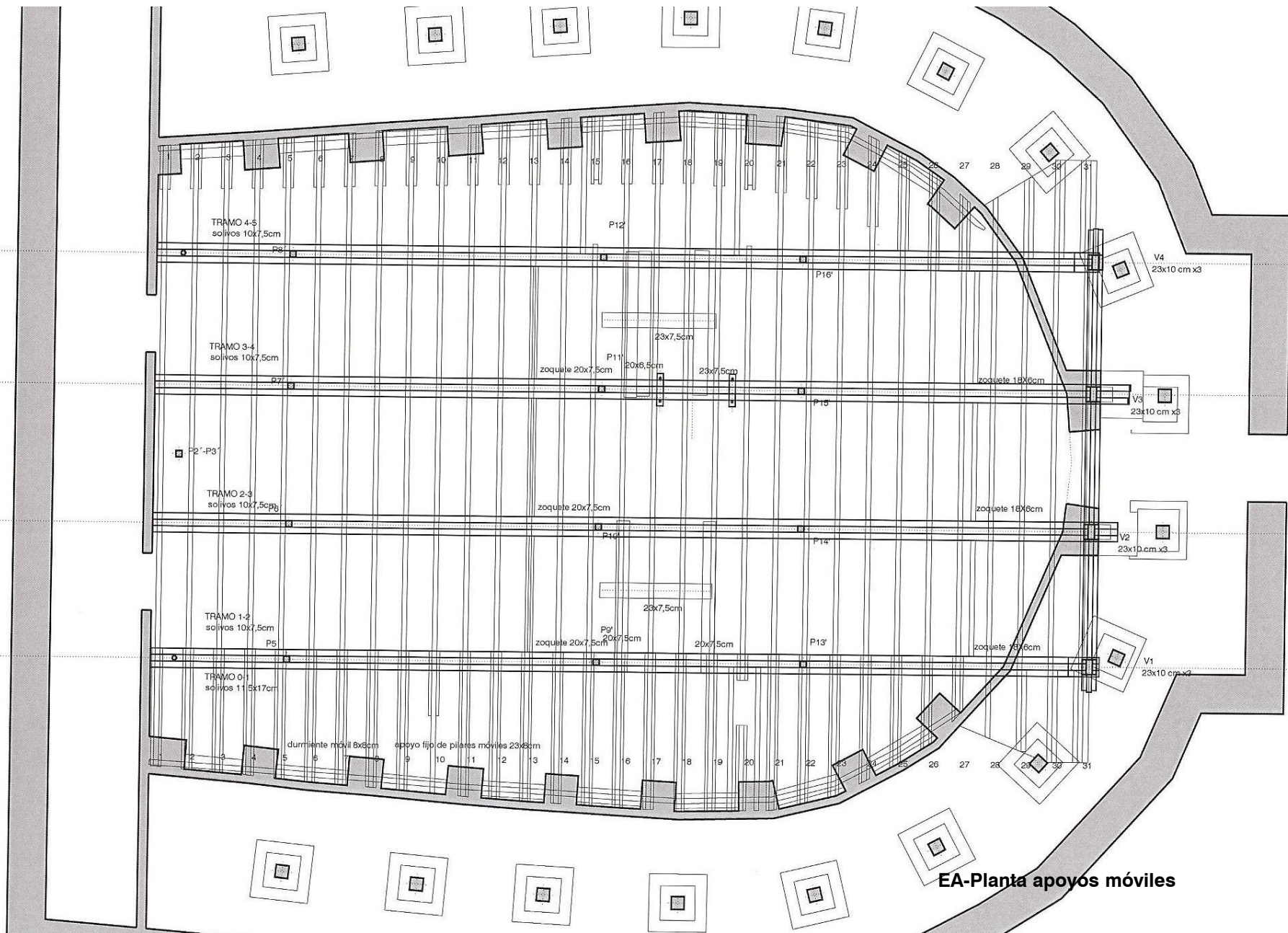
Preservation of the seating mobile wooden structure

Targets

Conservation of the wooden structure

Recovery of the movement

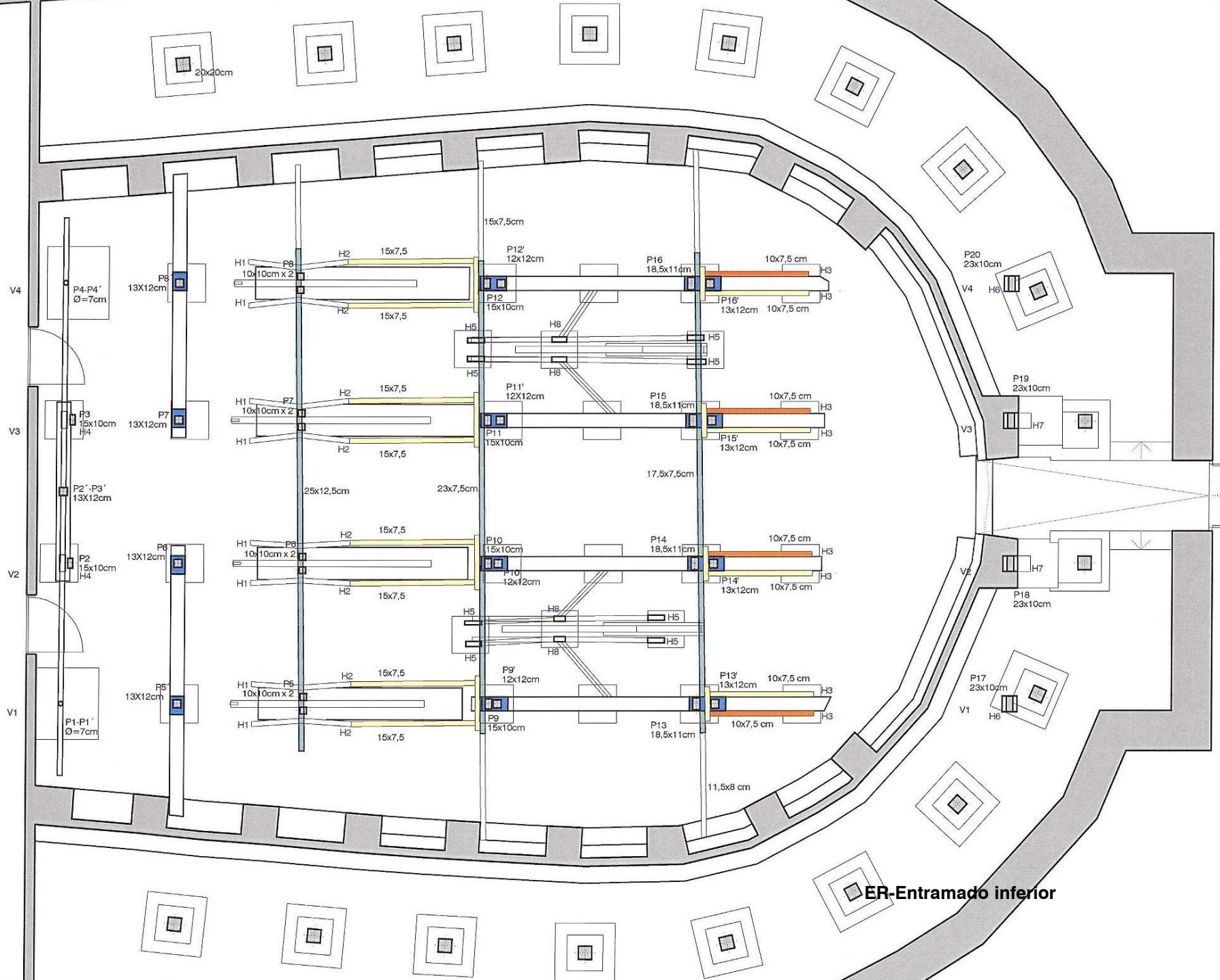


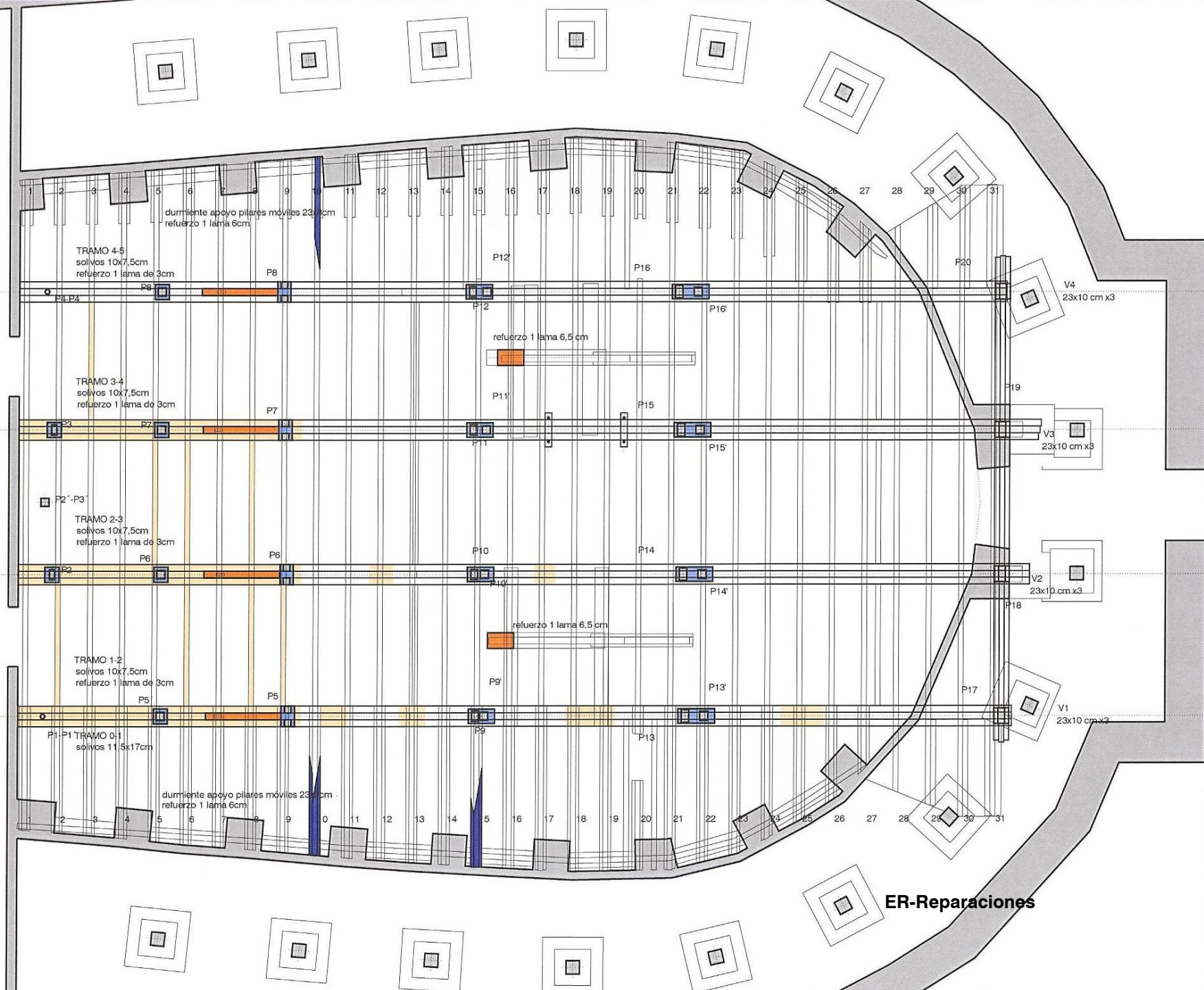


EA-Planta apoyos móviles







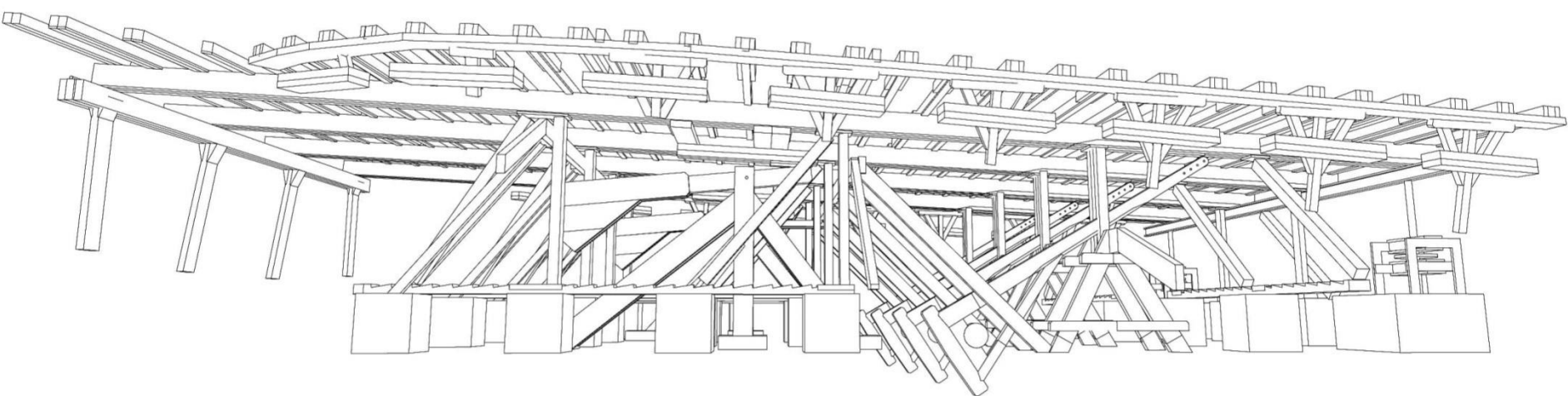


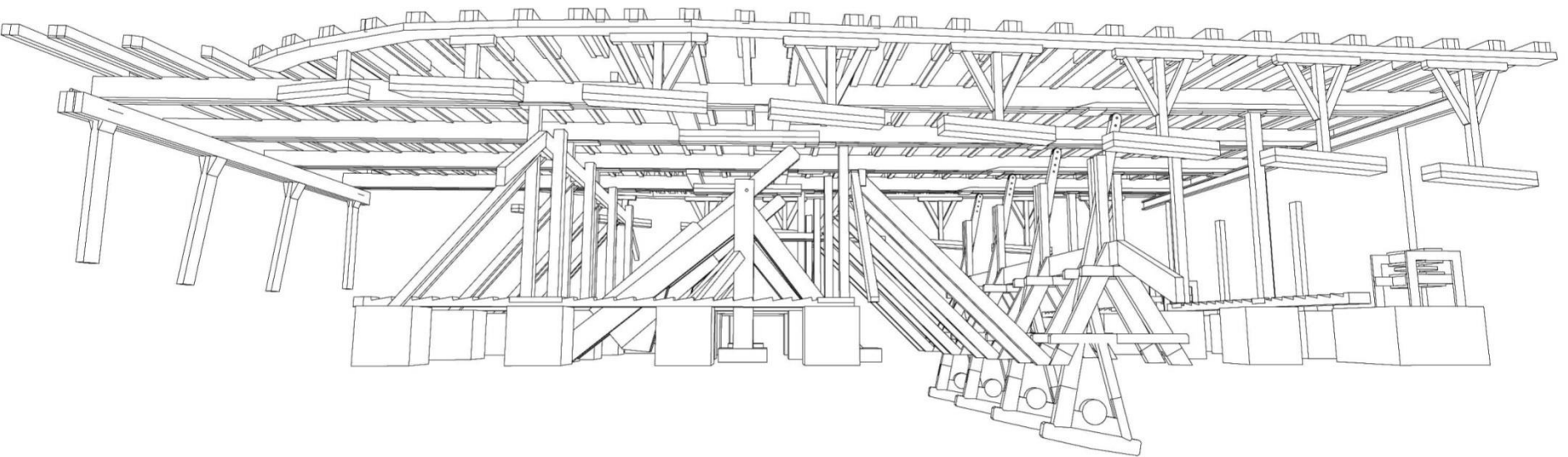














Condestable palace restoration. Pamplona. Spain
Cultural Centre

Targets

Integral restoration of the building

Respect to the existing including paintings

Implementation of a new use

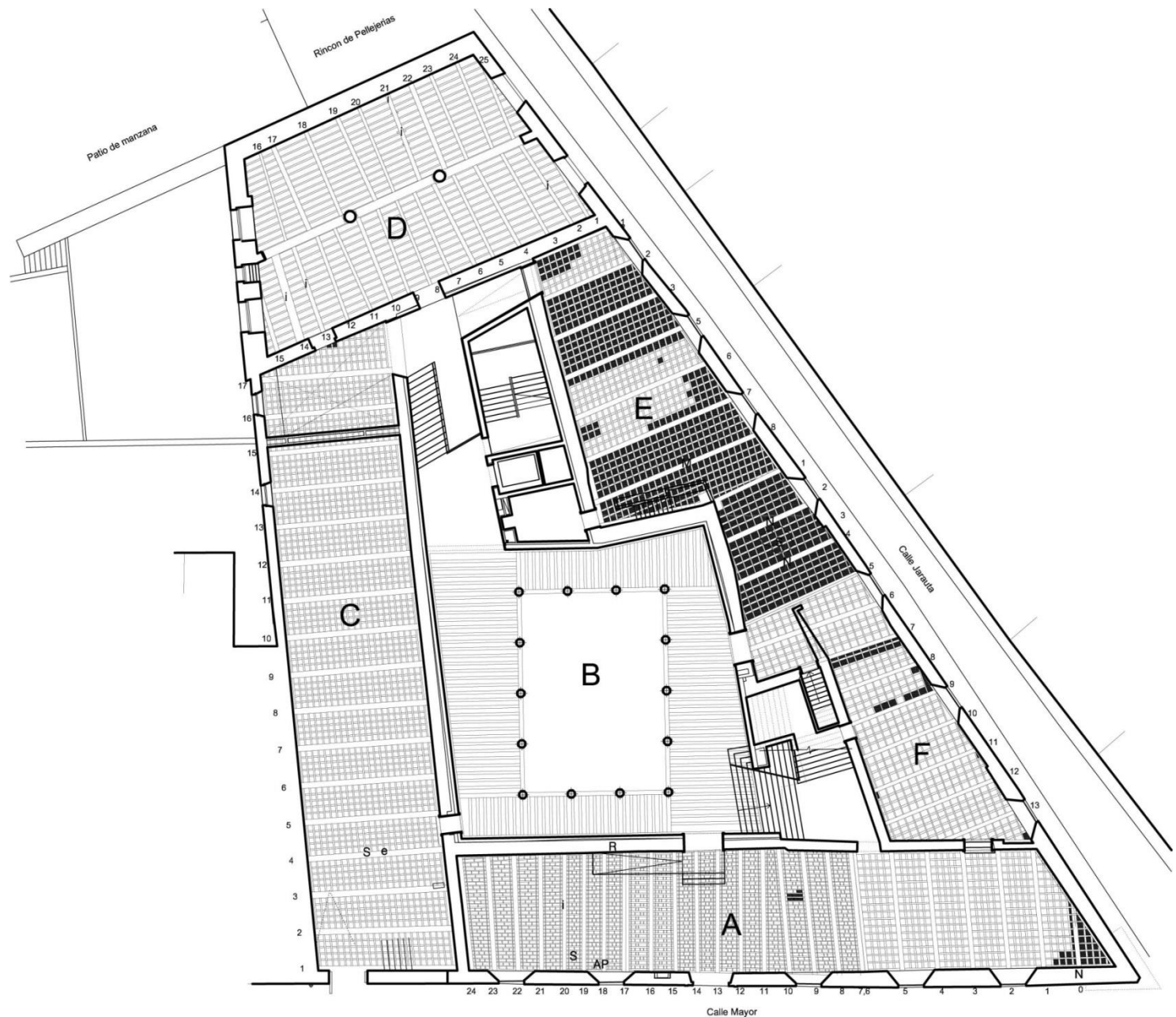
Tabuenca+Leache arquitectos Design

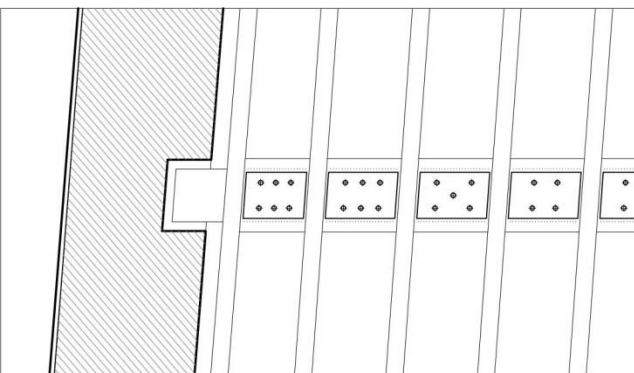
Landa+Ochandiano arquitectos Wooden structure



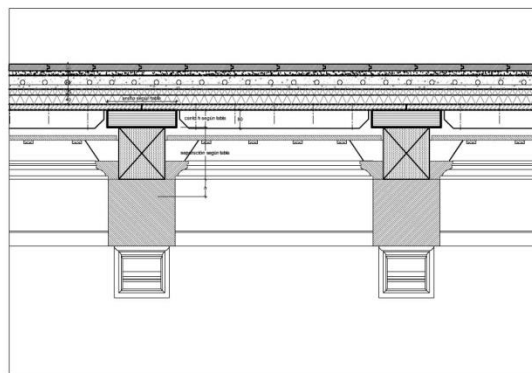




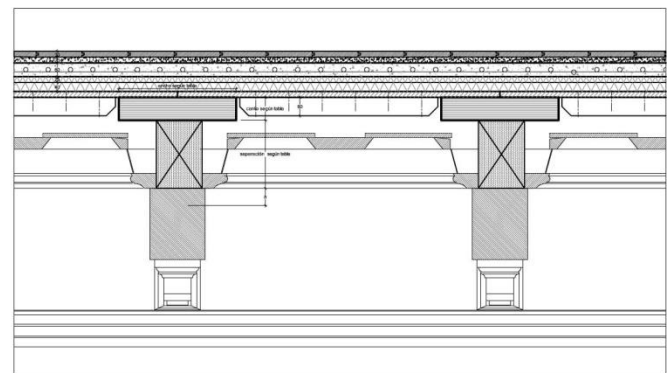




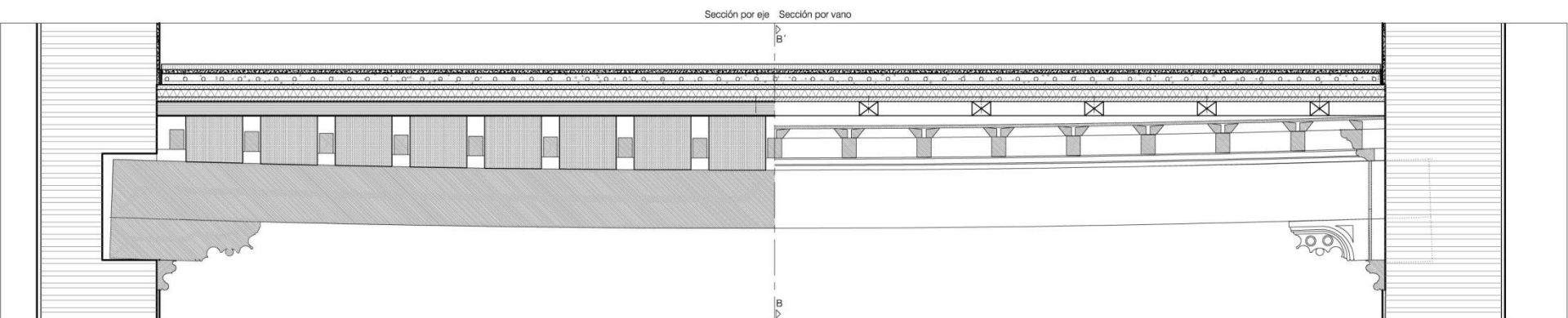
s1 planta



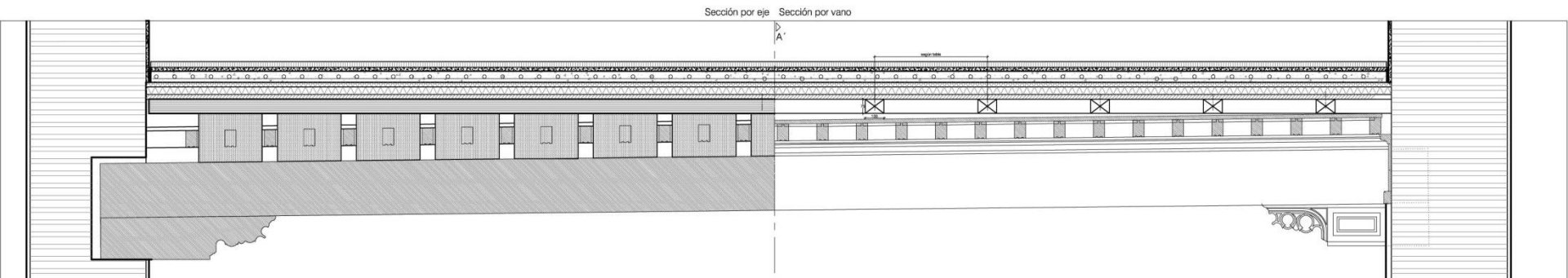
s0 A-A'



s1 B-B'

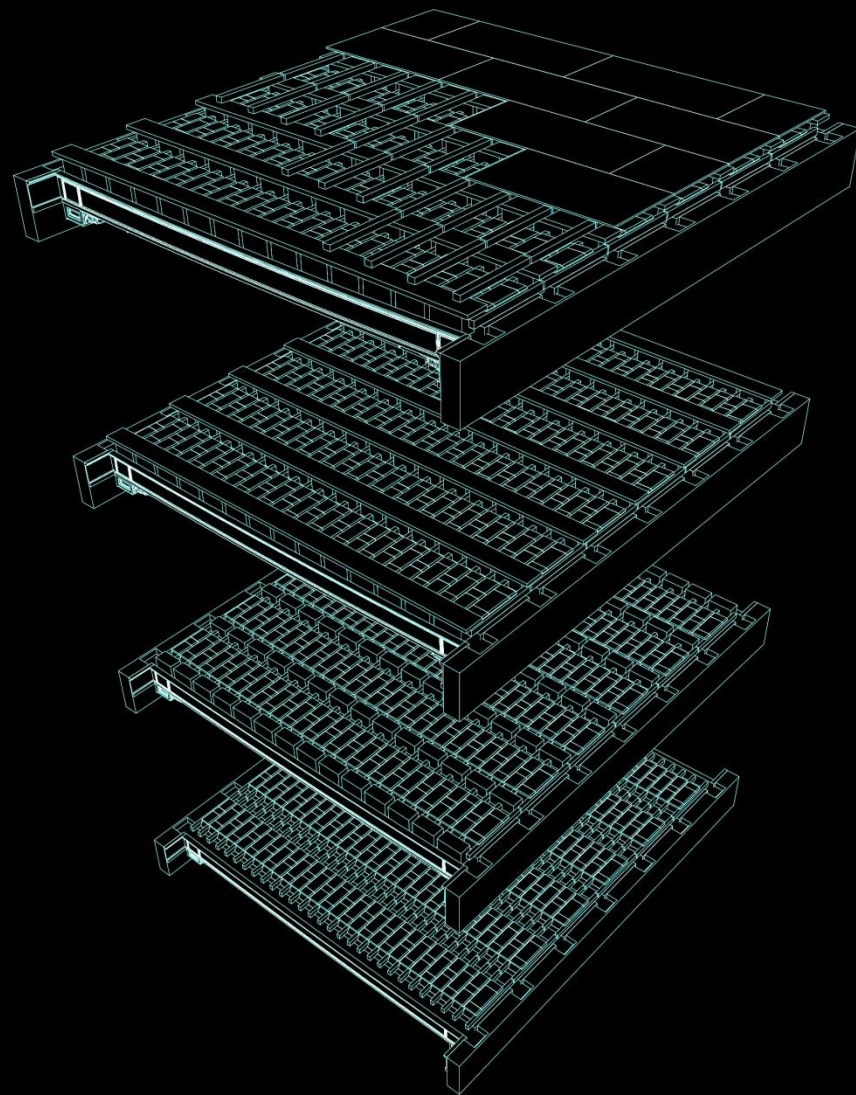


s1









Condestable Palace. Pamplona. Navarra



Condestable Palace. Pamplona. Navarra



Condestable Palace. Pamplona. Navarra



